EXHIBIT A

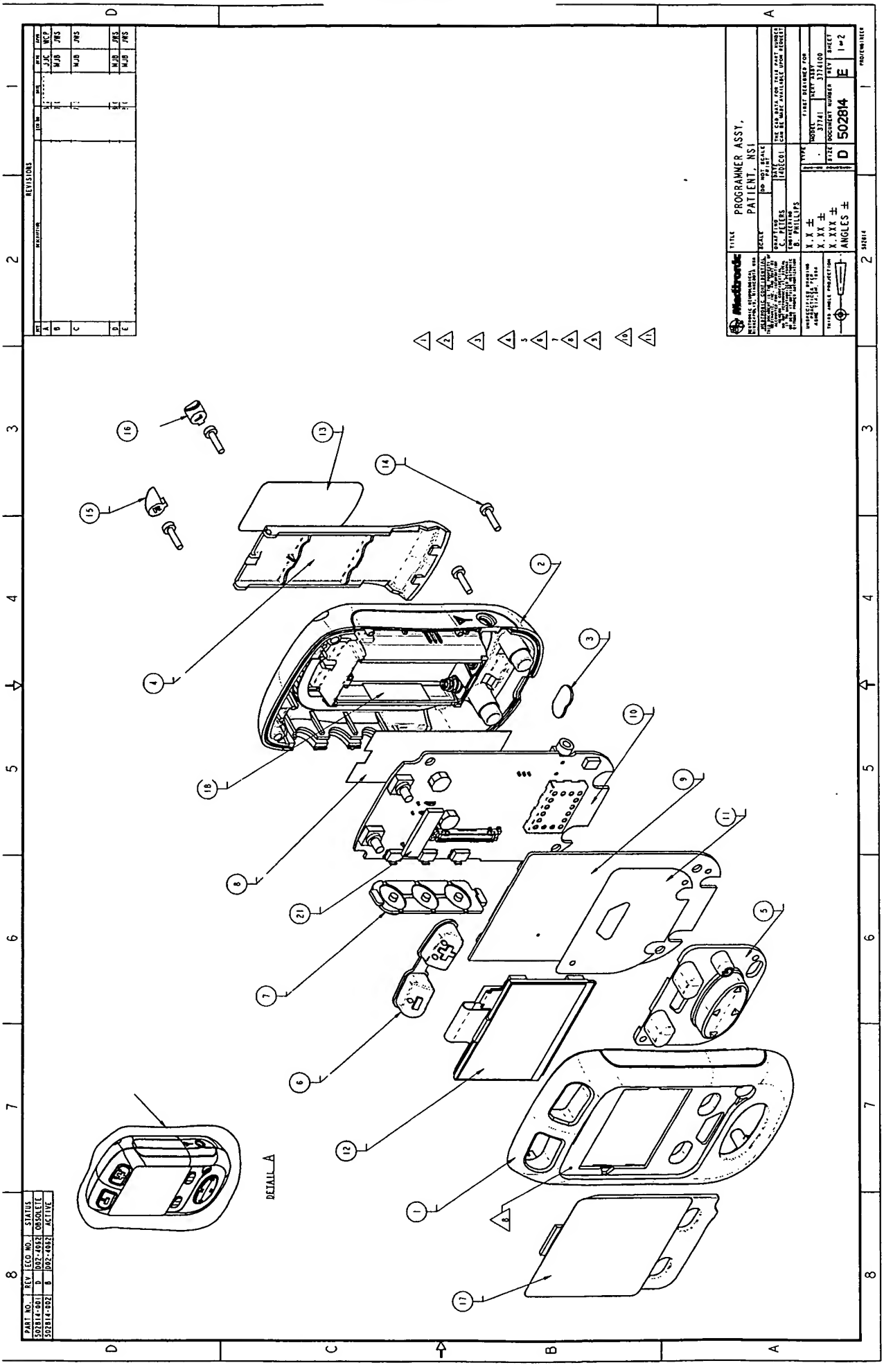


EXHIBIT A (cont.)

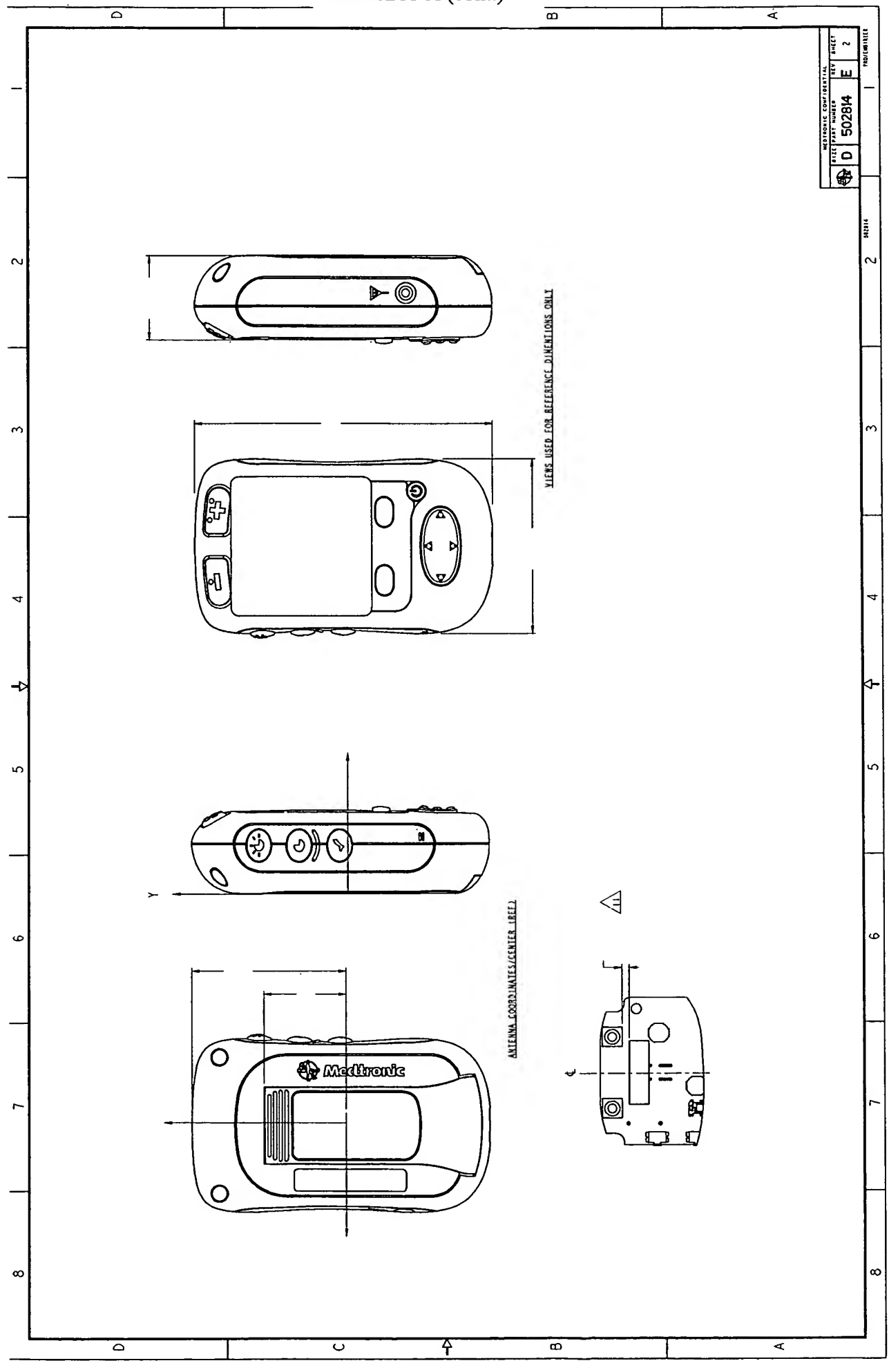


EXHIBIT B

Medtronic	*Neurological*	**Document Number** 288117-70205	Rev/Version 1.0	Sht 1 of 49
Title: Neuro Patient Programmer Platform Electrical DVT Report				

Revision History:

Revision	Comments
1.0	Initial release for routing

1 INTRODUCTION

This document is the electrical Design Verification Test (DVT) Report for the 37741 Patient Programmer Platform.

1.1 Purpose

The purpose of this report is to document the results of test plan .

1.2 Scope

This report applies only to design verification testing of the 37741 Patient Programmer Platform.

1.3 Document Overview

This document is organized as follows:

- Section 2 contains references and definitions.
- Section 3 contains a table with the list of tests, software revisions, sample sizes, and test results.
- Section 4 contains the results of the electrical design verification tests.

2 REFERENCES AND DEFINITIONS

This section identifies internal and external reference documents that augment the information provided in this document. It also defines terms, acronyms, and abbreviations used within the document.

2.1 Internal Medtronic References

Number	Name
120275	
215387	
288117-70040	
288117-70044	
288117-70029	
503011001	
288117-70200	

Note: Document revisions referenced in DVT Plan.

2.2 External References

Reference the PEM Electrical Specification for external specification standards.

2.3 Definitions, Acronyms, and Abbreviations

ARB: Arbitrary Waveform Generator

ARB equipment: One or more arbitrary waveform generators, used alone or in conjunction to generate sophisticated waveforms.

DUT: Device Under Test

DVT: Design Verification Test

DVT Console: The test console needed to perform the tests specified herein.

ES: Electrical Specification #120275

GPIB: General Purpose Interface Bus

PEM: Patient Electronic Module

PP: Patient Programmer

POR: Power On Reset

3 Test Results Summary

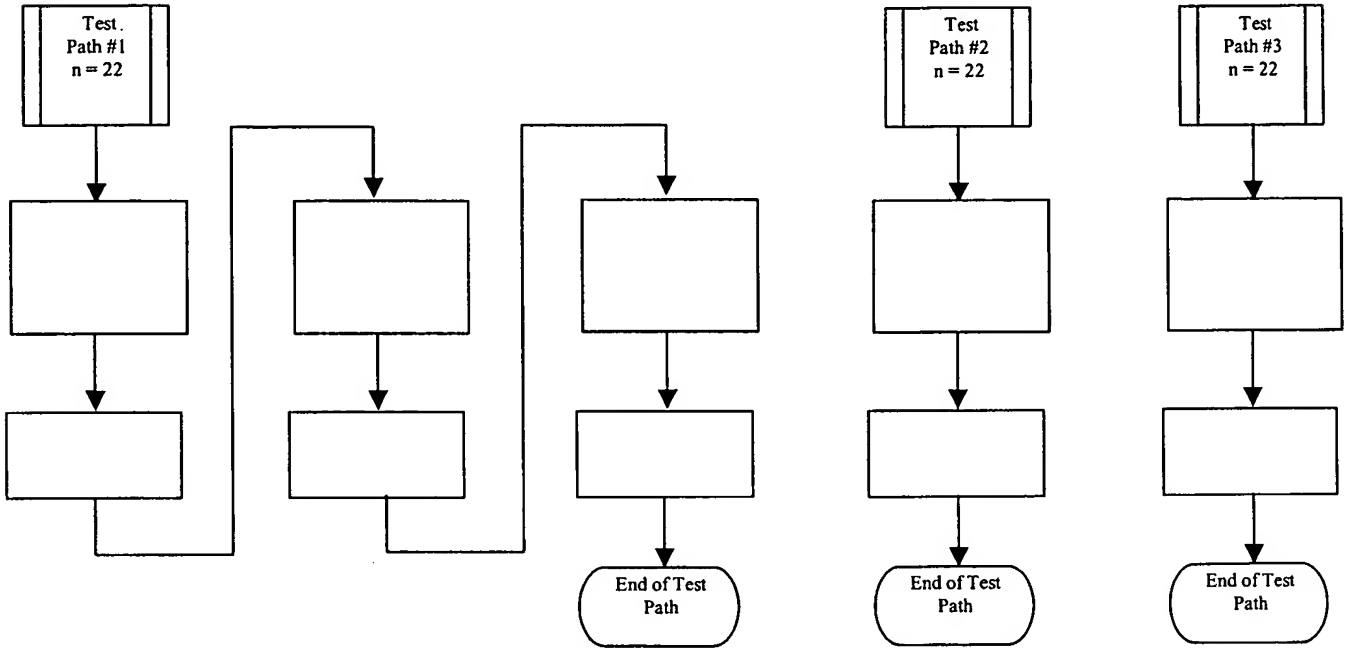
Table 1 summarizes the results of all electrical design verification testing. Section 4 details each test setup, criteria, and results.

- Test data is stored as 288117-70200.
- Table 1 indicates test name, sample size, DUT software revision, Test Script Software revision, test path, and results.
- Test paths are shown in section 3.1.

Table 1

Test Name	Sample Size	DUT Software Revision	Script Software Test Revision	Test Path	**Results**
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	22				PASS
	1				PASS

3.1 Test Paths



4 ELECTRICAL TESTS

This section specifies electrical tests performed on the 37741 Patient Programmer Platform.

4.1 Power Source Tests

4.1.1 Current Drain Test

4.1.1.1 Objective

To verify the current drain meets the requirements specified in the *Power Source* section of the PEM Electrical Specification.

4.1.1.2 Method and Equipment

4.1.1.3 Test Cases

There are _ test cases for transmit using all combinations of test values below:

Parameter	Test Values	Units

The

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

There are test cases using two combinations of test values below:

Parameter	Test Values	Units

There are total test cases.

4.1.1.4 Acceptance Criteria

Operating Condition (Ref.)	Antenna	Duty Cycle (%)	Current Drain (mA) MAX		
			V	V	V
Row A	INT				
Row B	INT				
Row C	INT				
Row D	INT				
Row E	INT				
Row F	INT				
Row G	INT				
Row H	EXT				
Row I	INT				
Row J	INT				

Note 1:

4.1.1.5 *Test Setup*

1.
2.
3.

4.

4.1.1.6 *Test Procedure*

1.
2.

3.

4.

4.1.1.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Operating Condition	Current Drain (mA) MAX															
Row	Spec	Min	Max	Mean	Std Dev		Spec	Min	Max	Mean	Std Dev		Spec	Min	Max	Mean	Std Dev
A																	
B																	
C																	
D																	
E																	
F																	
G																	
H																	
I																	
J																	

4.1.2 Supply Voltage Range Test

4.1.2.1 *Objective*

To verify the supply voltage range meets the requirements specified in the *Power Source* section of the PEM Electrical Specification.

4.1.2.2 *Method and Equipment*

4.1.2.3 *Test Cases*

Parameter	Test Values	Units

The

There is test case without transmit:

Parameter	Test Values	Units

4.1.2.4 *Acceptance Criteria*

Operating Condition	Antenna	H-Bridge Drive Duty Cycle (%)	Min operating voltage (V)

4.1.2.5 *Test Setup*

1.
2.
3.

4.

4.1.2.6 *Test Procedure*

1.

2.

3.

4.1.2.7 RESULTS **PASS**

All devices met the acceptance criteria.

Operating Condition	Antenna	Supply Voltage Range (Volts)				
		Min	Max	Avg	Std Dev	

4.2 Input/Output Connections Tests

4.2.1 Keypad Interface Test

4.2.1.1 Objective

To verify the keypad interface meets the requirements specified in the *Input/Output Connections* section of the PEM Electrical Specification.

4.2.1.2 Method and Equipment

4.2.1.3 Test Cases

Parameter	Test Values	Units

4.2.1.4 Acceptance Criteria

4.2.1.5 Test Setup

1.
2.

3.

4.2.1.6 Test Procedure

3.

4.2.1.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Tests	**Keypad Interface (pass/fail)**		
	Pass	Pass	Pass
	Pass	Pass	Pass

4.2.2 Display Interface Test

4.2.2.1 *Objective*

To verify the display interface meets the requirements specified in the *Input/Output Connections* section of the PEM Electrical Specification.

4.2.2.2 *Method and Equipment*

4.2.2.3 *Test Cases*

There are test cases using combinations of the test values below:

Parameter	**Test Values**	**Units**

4.2.2.4 *Acceptance Criteria*

Test Parameters				Requirements			

4.2.2.5 *Test Setup*

1.
2.

3.

4.2.2.6 *Test Procedure*

1.

2.
3.

4.

4.2.2.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Test	Display Interface (pass/fail)		
	Pass	Pass	Pass
	Pass	Pass	Pass
	Pass	Pass	Pass

4.2.3 External Antenna Interface Test

4.2.3.1 *Objective*

To verify the external antenna interface meets the requirements specified in the *Input/Output Connections* section of the PEM Electrical Specification.

4.2.3.2 *Method and Equipment*

4.2.3.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.2.3.4 *Acceptance Criteria*

- When an external antenna is connected, there should be no downlink from the internal antenna.
- When an external antenna is connected, the uP should detect that the antenna is connected.

External Antenna					
	Min	Max	Min	Max	Yes/No

4.2.3.5 *Test Setup*

1.
2.
3.
4.

5.

4.2.3.6 *Test Procedure*

1.

2.

3.

4.

4.2.3.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Test Configuration	Test
	A
	B

Test	External Antenna Interface (A/m)											
	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev
A												
B												

4.2.4 Infrared Port Interface Test

4.2.4.1 *Objective*

To verify the infrared port interface meets the requirements specified in the *Input/Output Connections* section of the PEM Electrical Specification. [PTPROG_PEMT-0006:*]

4.2.4.2 *Method and Equipment*

4.2.4.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.2.4.4 *Acceptance Criteria*

All	All	None

4.2.4.5 *Test Setup*

1.
2.

3.

4.2.4.6 *Test Procedure*

1.
2.
3.
4.

4.2.4.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

	Infrared (pass/fail)								
Voltage (V)									
	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

4.2.5 Audio Transducer Test

4.2.5.1 *Objective*

To verify the audio transducer meets the requirements specified in the *Input/Output Connections* section of the PEM Electrical Specification.

4.2.5.2 *Method and Equipment*

4.2.5.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.2.5.4 *Acceptance Criteria*

4.2.5.5 *Test Setup*

1.
2.
3.
4.

5.

4.2.5.6 *Test Procedure*

1.
2.
3.
4.

4.2.5.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

	Audio Transducer (dB SPL)											
	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev

4.2.6 Manufacturing/Test Interface Test

Manufacturing requirements defined in Test Specification, Patient Programmer, 215387.

4.3 Internal Resources Tests

4.3.1 Memory Test

4.3.1.1 Objective

To verify the internal memory resources meet the requirements specified in the *Internal Resources* section of the PEM Electrical Specification.

4.3.1.2 Method and Equipment

4.3.1.3 Test Cases

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.3.1.4 Acceptance Criteria

All	Pass

4.3.1.5 Test Setup

1.
2.

3.

4.3.1.6 Test Procedure

1.
2.
3.
4.

4.3.1.7 RESULTS **PASS**

All devices met the acceptance criteria.

Test	Memory (pass/fail)		
	Pass	Pass	Pass
	Pass	Pass	Pass
	Pass	Pass	Pass

4.3.2 Real-Time Clock Backup Test

4.3.2.1 *Objective*

To verify the real-time clock backup meets the requirements specified in the *Internal Resources* section of the PEM Electrical Specification.

4.3.2.2 *Method and Equipment*

4.3.2.3 *Test Cases*

There is one test case below:

Parameter	Test Value	Units

4.3.2.4 *Acceptance Criteria*

Test Case	Min Time w/o power (min)

4.3.2.5 *Test Setup*

1.
2.

3.

4.3.2.6 *Test Procedure*

1.
2.
3.
4.
5.

4.3.2.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Test	**Real-Time Backup (pass/fail)**		
	Pass	Pass	Pass

4.3.3 Real-Time Clock Accuracy Test

4.3.3.1 *Objective*

To verify the real-time clock accuracy meets the requirements specified in the *Internal Resources* section of the PEM Electrical Specification.

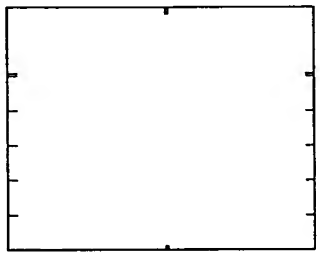
4.3.3.2 *Method and Equipment*

4.3.3.3 *Test Cases*

There are test cases (actually measurement points) using all combinations of test values below:

Parameter	**Test Value**	**Units**

4.3.3.4 *Acceptance Criteria*



4.3.3.5 *Test Setup*

1.
2.

4.3.3.6 *Test Procedure*

1.

2.

4.3.3.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

	Real Time Clock Accuracy (seconds)				

4.3.4 A/D Measurements Test

4.3.4.1 *Objective*

To verify the A/D measurement accuracy meets the requirements specified in the *Internal Resources* section of the PEM Electrical Specification.

4.3.4.2 *Method and Equipment*

4.3.4.3 *Test Cases*

There are test cases using the test values below:

Parameter	Test Values	Units

4.3.4.4 *Acceptance Criteria*

A/D Voltage	Test Value	Max Error (%)

4.3.4.5 *Test Setup*

1.
2.
3.

4.

5.

4.3.4.6 *Test Procedure*

1.

2.

3.

4.

4.3.4.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Input	Level	A/D Measurement (% ERROR)											
		Ambient Temp				Low Temp				High Temp			
		Min	Max	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev

4.3.5 D/A Control Voltages Test

4.3.5.1 *Objective*

To verify the D/A accuracy meets the requirements specified in the *Internal Resources* section of the PEM Electrical Specification.

4.3.5.2 *Method and Equipment*

4.3.5.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Value	Units

4.3.5.4 *Acceptance Criteria*

D/A Voltage	Measurement point	Max % Error

4.3.5.5 *Test Setup*

1.
2.
3.

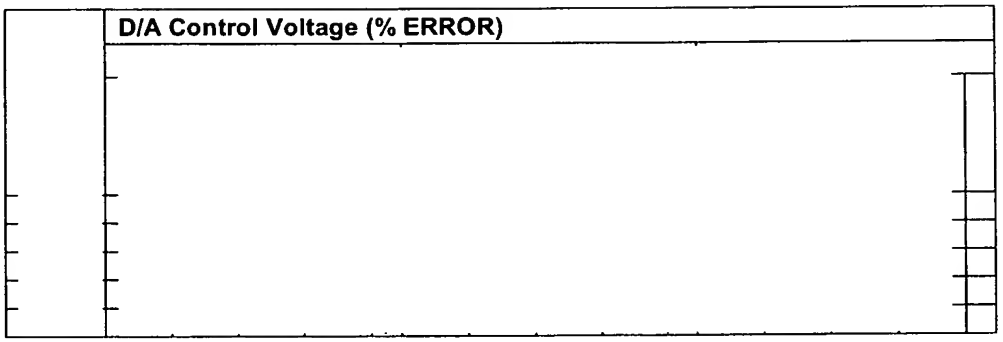
4.

4.3.5.6 *Test Procedure*

1.
2.
3.

4.3.5.7 *RESULTS* **PASS**

All devices met the acceptance criteria.



4.4 Transmit Telemetry (Downlink) Tests

4.4.1 Magnetic Field Intensity Test

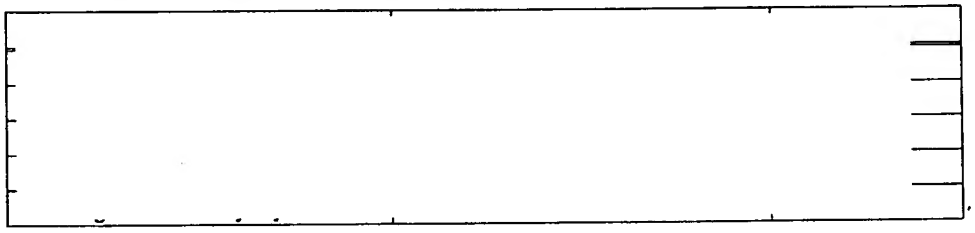
4.4.1.1 *Objective*

To verify downlink magnetic field intensity meets the requirements specified in the *Transmit Telemetry (Downlink)* section of the PEM Electrical Specification.

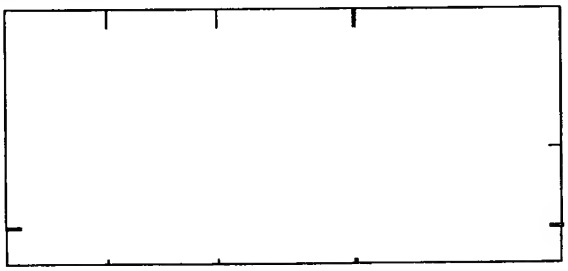
4.4.1.2 *Method and Equipment*

4.4.1.3 *Test Cases*

There are test cases at kHz using all combinations of test values below:



4.4.1.4 *Acceptance Criteria*



4.4.1.5 *Test Setup*

1.
2.
3.
4.

5.

4.4.1.6 *Test Procedure*

1.
2.

3.
4.

5.

4.4.1.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

	Magnetic Field Intensity (A/m)

4.4.2 Burst Characteristics Test

4.4.2.1 *Objective*

To verify downlink burst characteristics of width, rise time, fall time, frequency, and overshoot meet the requirements specified in the *Transmit Telemetry (Downlink)* section of the PEM Electrical Specification.

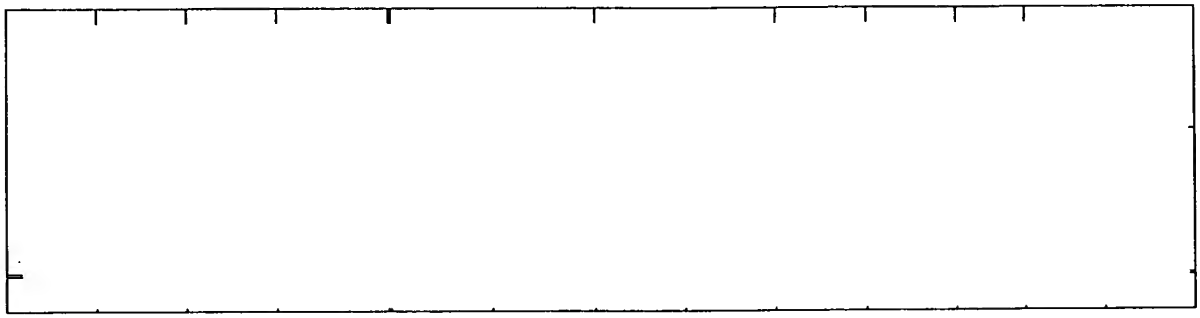
4.4.2.2 *Method and Equipment*

4.4.2.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.4.2.4 *Acceptance Criteria*



4.4.2.5 *Test Setup*

1.
2.
3.
4.

5.

4.4.2.6 *Test Procedure*

1.
2.

3.
4.
5.

4.4.2.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

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Antenna	Voltage	Test	Burst Characteristics											
			Ambient Temp				Low Temp				High Temp			
			Min	Max	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev

4.5 Receive Telemetry (Uplink) Tests

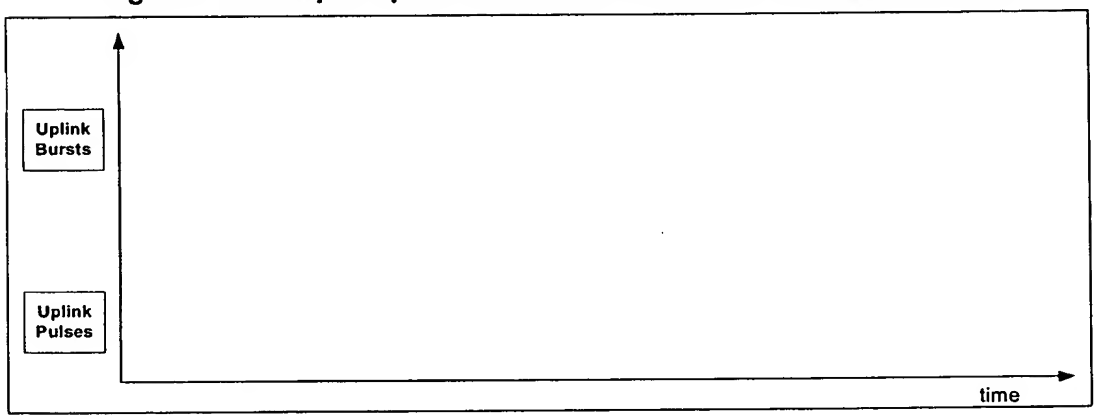
4.5.1 Detection Threshold Test

4.5.1.1 Objective

To verify uplink detection threshold (i.e. receiver sensitivity) meets the requirements specified in the *Receive Telemetry (Uplink)* section of the PEM Electrical Specification.

4.5.1.2 Method and Equipment

Figure 1: Example Uplink Detection Threshold Test Waveforms



4.5.1.3 Test Cases

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

The supply voltage is 2.5 V.

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4.5.1.4 *Acceptance Criteria*

Antenna	Telemetry Type	Detection Onset (Uplink dB)	Detection Threshold (Uplink dB)	Maximum Input Level (Uplink dB)
		Max	Max	Max

4.5.1.5 *Test Setup*

1.
2.
3.
4.

5.

4.5.1.6 *Test Procedure*

1.
2.
3.

4.

4.5.1.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Antenna	Telemetry	Detection Threshold (dB)												
		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

Antenna	Telemetry	**Maximum Input Level (pass/fail)**		
		Pass	Pass	Pass
		Pass	Pass	Pass
		Pass	Pass	Pass
		Pass	Pass	Pass
		Pass	Pass	Pass
		Pass	Pass	Pass

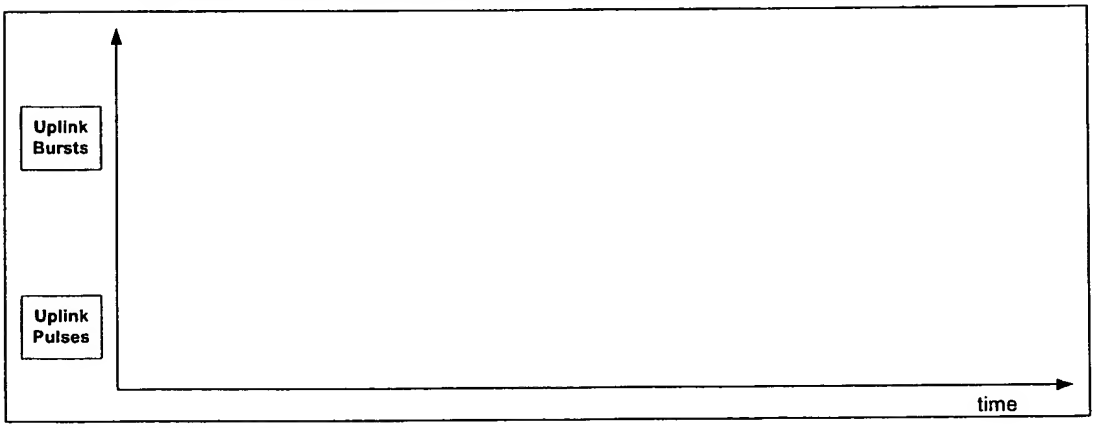
4.5.2 Detection Margin Test

4.5.2.1 *Objective*

To verify uplink detection margin meets the requirements specified in the *Receive Telemetry (Uplink)* section of the PEM Electrical Specification.

4.5.2.2 *Method and Equipment*

Figure 2: Example Uplink Detection Margin Test Waveforms



4.5.2.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.5.2.4 *Acceptance Criteria*

Telemetry Type	Data Bursts	Amplitude A1	Antenna	Detection Margin (Uplink dB)	
				Min	Max

4.5.2.5 *Test Setup*

1.
2.
3.
4.

5.

4.5.2.6 *Test Procedure*

1.
2.
3.

4.

4.5.2.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Antenna	Telemetry	Detection Margin (dB)													
		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

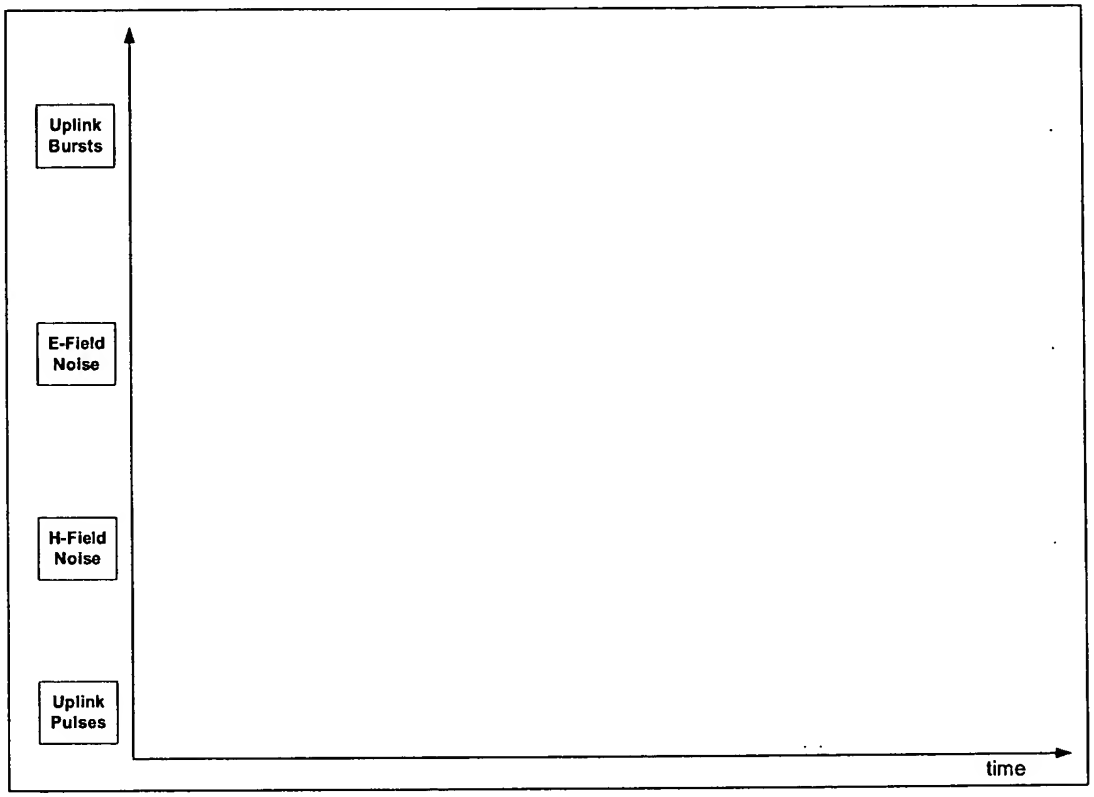
4.5.3 Noise Immunity Test

4.5.3.1 *Objective*

To verify uplink noise immunity meets the requirements specified in the *Receive Telemetry (Uplink)* section of the PEM Electrical Specification.

4.5.3.2 *Method and Equipment*

Figure 3: Example Uplink Noise Immunity Test Waveforms



4.5.3.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.5.3.4 *Acceptance Criteria*

Telemetry Type	Uplink Level A1 (dB)	Antenna	Min E-Noise Immunity (dB)	Min H-Noise Immunity (dB)

4.5.3.5 *Test Setup*

1.
2.
3.
4.
5.

6.

4.5.3.6 *Test Procedure*

1.
2.
3.
4.

5.

4.5.3.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Antenna	Noise	Telemetry	Noise Immunity (dB)													
			Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

4.5.4 Signal Distortion Test

4.5.4.1 *Objective*

To verify uplink signal distortion meets the requirements specified in the *Receive Telemetry (Uplink)* section of the PEM Electrical Specification.

4.5.4.2 *Method and Equipment*

4.5.4.3 *Test Cases*

Parameter	Test Values	Units

There are test cases for Tel A, and test cases for Tel N.

4.5.4.4 *Acceptance Criteria*

Telemetry Type	Uplink Level A1 (dB)	Antenna	Interval Distortion (µS)	Active/Idle Distortion (µS)

4.5.4.5 *Test Setup*

1.
2.
3.
4.

5.

4.5.4.6 *Test Procedure*

1.
2.
3.

4.

4.5.4.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

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Antenna	Test	Uplink (dB)	Signal Distortion Telemetry A (us)												
			Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

Antenna	Test	Uplink (dB)	Signal Distortion Telemetry N, 0's (us)												
			Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

Antenna	Test	Uplink (dB)	Signal Distortion Telemetry N, 1's (us)												
			Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

4.5.5 Turnaround Time Test

4.5.5.1 *Objective*

To verify uplink turnaround time meets the requirements specified in the *Receive Telemetry (Uplink)* section of the PEM Electrical Specification.

4.5.5.2 *Method and Equipment*

4.5.5.3 *Test Cases*

There are test cases using all combinations of test values below:

Parameter	Test Values	Units

4.5.5.4 *Acceptance Criteria*

Supply Voltage	H-Bridge Drive Duty Cycle	Turnaround Time (mS)

4.5.5.5 *Test Setup*

1.
2.

3.

4.5.5.6 *Test Procedure*

1.

2.
3.
4.

4.5.5.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Test	Turnaround Time (pass/fail)

4.5.6 Hold Drift Test

4.5.6.1 *Objective*

To verify the hold drift meets the requirements specified in the *Receive Telemetry (Uplink)* section of the PEM Electrical Specification.

4.5.6.2 *Method and Equipment*

4.5.6.3 *Test Cases*

There is test case:

Parameter	Uplink Level	Units

4.5.6.4 *Acceptance Criteria*

Time after hold circuit enabled	Max Hold Drift

4.5.6.5 *Test Setup*

1.
2.
3.

4.5.6.6 *Test Procedure*

1.
2.
3.
4.
5.
6.
7.
8.
9.
10

4.5.6.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

Hold Drift (mV)

4.5.7 New-Battery FET Test

4.5.7.1 *Objective*

To verify that enabling the new-battery FET circuit reduces the receiver noise floor (ambient RF energy detected by the receiver circuit) when new batteries are used.

4.5.7.2 *Method and Equipment*

4.5.7.3 *Test Cases*

There is test case:

Parameter	Uplink Level	Units

4.5.7.4 *Acceptance Criteria*

Supply Voltage	New-Battery FET	RSSI Peak

4.5.7.5 *Test Setup*

1.
2.
3.

4.5.7.6 *Test Procedure*

1.
2.
3.
4.
5.
6.
7.

4.5.7.7 *RESULTS* **PASS**

All devices met the acceptance criteria.

	New-Battery FET (mV)												
	Min	Max	Mean	Std dev		Min	Max	Mean	Std dev		Min	Max	Mean	Std dev

4.6 Telemetry Performance Tests

4.6.1 Telemetry Map Area at a Fixed Distance Test

4.6.1.1 *Objective*

To verify telemetry performance in terms of map area at a fixed distance meets the requirements specified in the *Telemetry Performance* section of the PEM Electrical Specification.

4.6.1.2 *Method and Equipment*

4.6.1.3 *Test Cases*

Parameter	Test Values	Units

There are test cases.

4.6.1.4 *Acceptance Criteria*

IPG	Antenna	Map Area @ 5cm

4.6.1.5 *Test Setup*

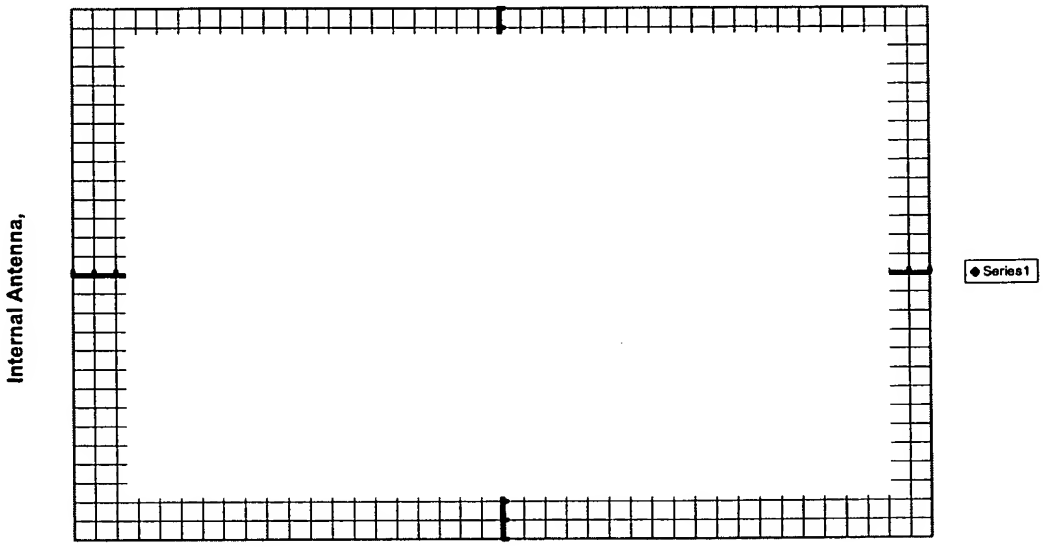
1.
2.

4.6.1.6 *Test Procedure*

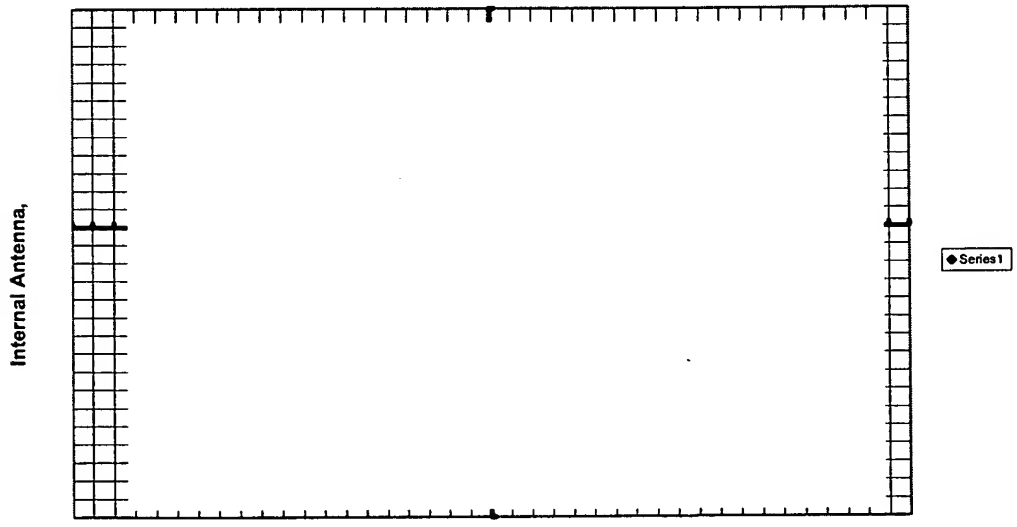
1.
2.
3.
4.
5.
6.
7.
8.

4.6.1.7 *RESULTS* **PASS**

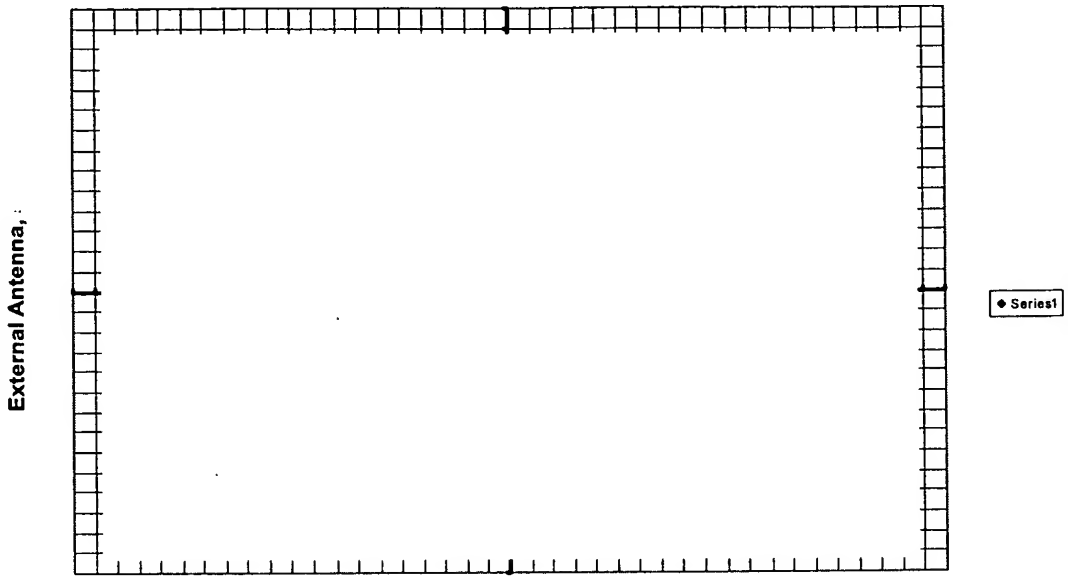
4.6.1.7.1 Internal Antenna Map @



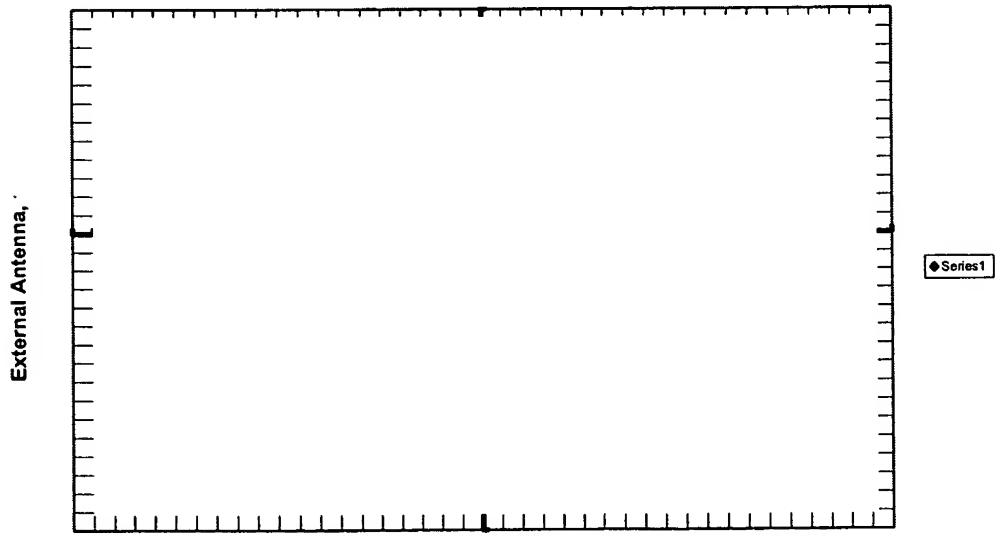
4.6.1.7.2 Internal Antenna @



4.6.1.7.3 External Antenna Map @

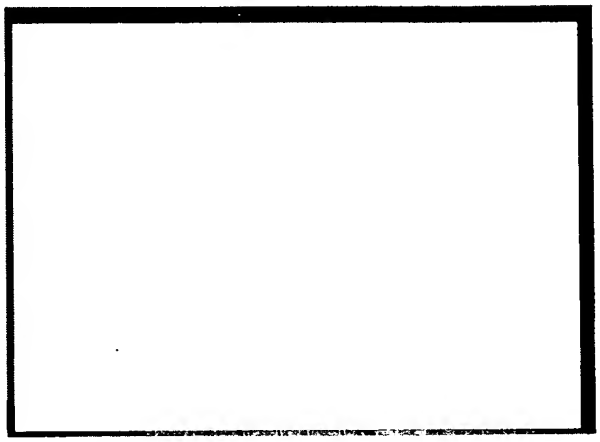


4.6.1.7.4 External Antenna @

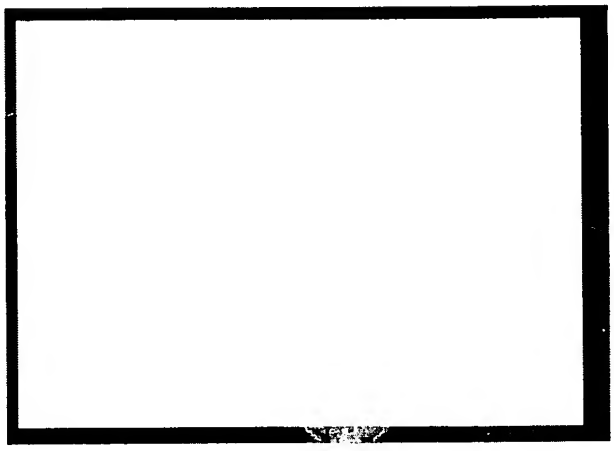


4.6.1.7.5 Photo of test fixture showing

in this photo.



4.6.1.7.6 Photo of



5 COMPLETION

This paragraph concludes this test specification.

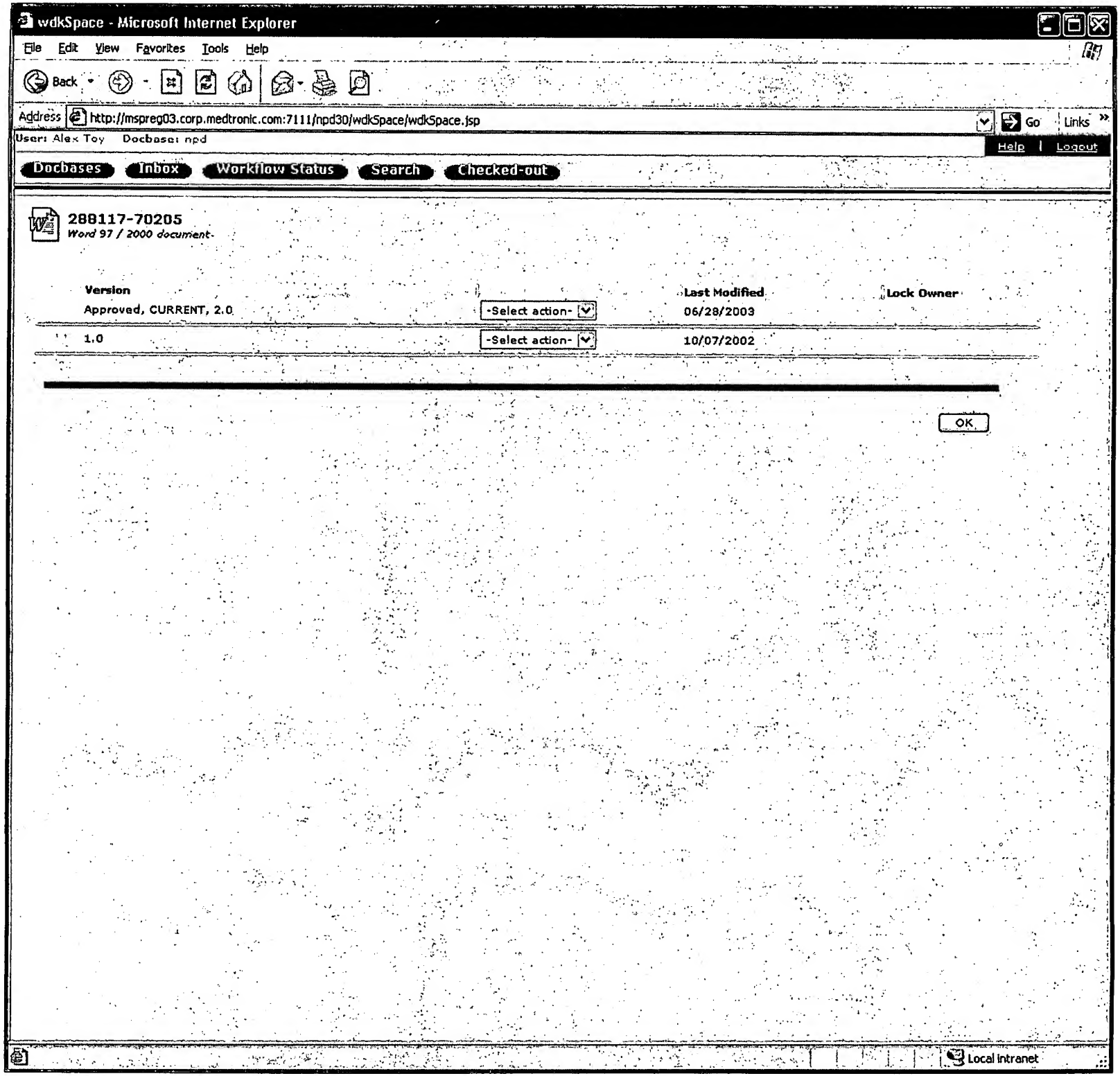

wdkSpace - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://mspreg03.corp.medtronic.com:7111/npd30/wdkSpace/wdkSpace.jsp
Go Links
User: Alex Toy Docbase: npd
Help | Logout
Docbases Inbox Workflow Status Search Checked-out
288117-70205
Word 97 / 2000 document
Version
Approved, CURRENT, 2.0
-Select action-
06/28/2003
1.0
-Select action-
10/07/2002
Last Modified
Lock Owner
OK
Local intranet

Exhibit C

Test Path #1 from DVT Plan 288117-70020 Section 7.0

DVT Pre-Test Performed to verify operational units.

Serial Number	Buttons operational	Audio	LCD	Battery contact	Battery Door	Real time clock	IR	Backlight	Communication	Results
NJD000018P	x	x	x	x	x	x	x	x	x	OK
NJD000019P	x	x	x	x	x	x	x	x	x	OK
NJD000020P	x	x	x	x	x	x	x	x	x	OK
NJD000022P	x	x	x	x	x	x	x	x	x	OK
NJD000024P	x	x	x	x	x	x	x	x	x	OK
NJD000025P	x	x	x	x	x	x	x	x	x	OK
NJD000026P	x	x	x	x	x	x	x	x	x	OK
NJD000028P	x	x	x	x	x	x	x	x	x	OK
NJD000031P	x	x	x	x	x	x	x	x	x	OK
NJD000033P	x	x	x	x	x	x	x	x	x	OK
NJD000034P	x	x	x	x	x	x	x	x	x	OK
NJD000035P	x	x	x	x	x	x	x	x	x	OK
NJD000036P	x	x	x	x	x	x	x	x	x	OK
NJD000037P	x	x	x	x	x	x	x	x	x	OK
NJD000077P	x	x	x	x	x	x	x	x	x	OK
NJD000078P	x	x	x	x	x	x	x	x	x	OK
NJD000079P	x	x	x	x	x	x	x	x	x	OK
NJD000080P	x	x	x	x	x	x	x	x	x	OK
NJD000138P	x	x	x	x	x	x	x	x	x	OK
NJD000139P	x	x	x	x	x	x	x	x	x	OK
NJD000140P	x	x	x	x	x	x	x	x	x	OK
NJD000149P	x	x	x	x	x	x	x	x	x	OK

Testing performed by Date: 23-May-02

EQUIPMENT:

Exhibit D

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices.

DATE: 29 MAY 02 INITIAL VISUAL & ELECTRICAL

		Requestor
SERIAL#	VISUAL	did functional
NJD000018P	O.K.	X
NJD000019P	O.K.	X
NJD000020P	O.K.	X
NJD000022P	O.K.	X
NJD000024P	O.K.	X
NJD000025P	O.K.	X
NJD000026P	O.K.	X
NJD000028P	O.K.	X
NJD000031P	O.K.	X
NJD000033P	O.K.	X
NJD000034P	O.K.	X
NJD000035P	O.K.	X
NJD000036P	O.K.	X
NJD000037P	O.K.	X
NJD000077P	O.K.	X
NJD000078P	O.K.	X
NJD000079P	O.K.	X
NJD000080P	O.K.	X
NJD000138P	O.K.	X
NJD000139P	O.K.	X
NJD000140P	O.K.	X
NJD000149P	O.K.	X
	3-Jun	

RESULTS: NO ANOMALIES NOTED

Exhibit D (cont.)

SUMMERY SHEET

TEST PLAN: 288117-70020

Patient Programmer for Neuro devices. Life cycle of battery contacts and door, and external antenna jack.

DATE: 19-Jun-02

Subject samples

288117-70020 test number / Serial Number	Battery Door 6.3.3 cycles	Battery Contact 6.3.4 cycles	External Antenna 6.3.5 cycles	Tested by:	Dimension 6.3.1 Length	Width	Ht.	Weight w/o batteries 6.3.2 oz.	2 AA batteries oz.	Total Weight oz.
NJD000018P										
NJD000019P										
NJD000020P										
NJD000022P										
NJD000024P										
NJD000025P										
NJD000026P										
NJD000028P										
NJD000031P										
NJD000033P										
NJD000034P										
NJD000035P										
NJD000036P										
NJD000037P										
NJD000077P										
NJD000078P										
NJD000079P										
NJD000080P										
NJD000138P										
NJD000139P										
NJD000140P										
NJD000149P										
Average										

Std Dev
Dimensions per print 502814

EQUIPMENT:

Exhibit D (cont.)

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices. Storage Temperature paragraph 6.2.2 of test plan.

DATE: 19-Jun-02 All Functional Testing done per 6.1 except backlight and IR port.

Subject samples to low temp. storage of degrees F for hours then degrees F for hours.

Functional test samples post each temperature storage.

Serial #		Functional		Functional
NJD000018P				
NJD000019P				
NJD000020P				
NJD000022P				
NJD000024P				
NJD000025P				
NJD000026P				
NJD000028P				
NJD000031P				
NJD000033P				
NJD000034P				
NJD000035P				
NJD000036P				
NJD000037P				
NJD000077P				
NJD000078P				
NJD000079P				
NJD000080P				
NJD000138P				
NJD000139P				
NJD000140P				
NJD000149P				
Date: Complete	18-Jun	18-Jun	19-Jun	19-Jun

NOTES: A=
B=
C=

Results:

EQUIPMENT:

Exhibit D (cont.)

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices. Operating Temperature paragraph 6.2.1 of test plan.

DATE: 4-Jun-02 All Functional Testing done per 6.1 except backlight and IR port.

Subject samples to Low temp. storage of degrees F for hours then degrees F for hours.

Serial #	Low temp.	Functional	High Temp.	Functional
NJD000018P				
NJD000019P				
NJD000020P				
NJD000022P				
NJD000024P				
NJD000025P				
NJD000026P				
NJD000028P				
NJD000031P				
NJD000033P				
NJD000034P				
NJD000035P				
NJD000036P				
NJD000037P				
NJD000077P				
NJD000078P				
NJD000079P				
NJD000080P				
NJD000138P				
NJD000139P				
NJD000140P				
NJD000149P				
Date: Complete	4-Jun	4-Jun	5-Jun	5-Jun

NOTES: A=

Results:

EQUIPMENT:

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices.

DATE: 20-Jun-02 Thermal Shock paragraph 6.2.3 of test plan.

Subject samples tc cycles of degrees F, l , degrees F, then l

Dwell at each temperature for 1 hour. All Functional Testing done per 6.1 except backlight and IR port.

	Thermal	Functional	Visual
Serial #	Shock	Testing	
NJD000018P			
NJD000019P			
NJD000020P			
NJD000022P			
NJD000024P			
NJD000025P			
NJD000026P			
NJD000028P			
NJD000031P			
NJD000033P			
NJD000034P			
NJD000035P			
NJD000036P			
NJD000037P			
NJD000077P			
NJD000078P			
NJD000079P			
NJD000080P			
NJD000138P			
NJD000139P			
NJD000140P			
NJD000149P			

NOTES: A=

RESULTS:

EQUIPMENT:

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices.

DATE: 21-Jun-02 Chemical Resistance paragraph 6.2.7 of test plan.

Subject samples to

	Chemical	Visual
Serial #	Testing	
NJD000018P		
NJD000019P		
NJD000020P		
NJD000022P		
NJD000024P		
NJD000025P		
NJD000026P		
NJD000028P		
NJD000031P		
NJD000033P		
NJD000034P		
NJD000035P		
NJD000036P		
NJD000037P		
NJD000077P		
NJD000078P		
NJD000079P		
NJD000080P		
NJD000138P		
NJD000139P		
NJD000140P		
NJD000149P		

RESULTS:

EQUIPMENT:

Test Path #2 from DVT Plan 288117-70020 Section 7.0

DVT Pre-Test Performed to verify operational units.

Serial Number	Buttons operational	Audio	LCD	Battery contact	Battery Door	Real time clock	IR	Backlight	Communication	Results
NJD000109P	x	x	x	x	x	x	x	x	x	OK
NJD000110P	x	x	x	x	x	x	x	x	x	OK
NJD000111P	x	x	x	x	x	x	x	x	x	OK
NJD000113P	x	x	x	x	x	x	x	x	x	OK
NJD000114P	x	x	x	x	x	x	x	x	x	OK
NJD000116P	x	x	x	x	x	x	x	x	x	OK
NJD000119P	x	x	x	x	x	x	x	x	x	OK
NJD000120P	x	x	x	x	x	x	x	x	x	OK
NJD000121P	x	x	x	x	x	x	x	x	x	OK
NJD000122P	x	x	x	x	x	x	x	x	x	OK
NJD000123P	x	x	x	x	x	x	x	x	x	OK
NJD000124P	x	x	x	x	x	x	x	x	x	OK
NJD000126P	x	x	x	x	x	x	x	x	x	OK
NJD000127P	x	x	x	x	x	x	x	x	x	OK
NJD000128P	x	x	x	x	x	x	x	x	x	OK
NJD000129P	x	x	x	x	x	x	x	x	x	OK
NJD000130P	x	x	x	x	x	x	x	x	x	OK
NJD000131P	x	x	x	x	x	x	x	x	x	OK
NJD000133P	x	x	x	x	x	x	x	x	x	OK
NJD000134P	x	x	x	x	x	x	x	x	x	OK
NJD000136P	x	x	x	x	x	x	x	x	x	OK
NJD000137P	x	x	x	x	x	x	x	x	x	OK

Testing performed by Date: 23-May-02

EQUIPMENT:

Exhibit D (cont.)

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices.

DATE: 29 MAY 02 INITIAL VISUAL & ELECTRICAL

		Requestor
SERIAL#	VISUAL	did functional
NJD000109P	O.K.	X
NJD000110P	O.K.	X
NJD000111P	O.K.	X
NJD000113P	O.K.	X
NJD000114P	O.K.	X
NJD000116P	O.K.	X
NJD000119P	O.K.	X
NJD000120P	O.K.	X
NJD000121P	O.K.	X
NJD000122P	O.K.	X
NJD000123P	O.K.	X
NJD000124P	O.K.	X
NJD000126P	O.K.	X
NJD000127P	O.K.	X
NJD000128P	O.K.	X
NJD000129P	O.K.	X
NJD000130P	O.K.	X
NJD000131P	O.K.	X
NJD000133P	O.K.	X
NJD000134P	O.K.	X
NJD000136P	O.K.	X
NJD000137P	O.K.	X
	29-May	

RESULTS:

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices. Broad Band Random Vibration paragraph 6.2.4 of test plan.

DATE: 4-Jun-02 All Functional Testing done per 6.1 except backlight and IR port.

Subject samples to

(. . . . .).

SERIAL#	Back down	Visual	R. side dow	Visual	Top up	Visual	Functional	Observations
NJD000109P								
NJD000110P								
NJD000111P								
NJD000113P								
NJD000114P								
NJD000116P								
NJD000119P								
NJD000120P								
NJD000121P								
NJD000122P								
NJD000123P								
NJD000124P								
NJD000126P								
NJD000127P								
NJD000128P								
NJD000129P								
NJD000130P								
NJD000131P								
NJD000133P								
NJD000134P								
NJD000136P								
NJD000137P								
Date Completed	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	13-Jun	

NOTES: A=
B=
C=

RESULTS:

EQUIPMENT:

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH: ROY POPE**

Patient Programmer for Neuro devices. Mechanical Shock paragraph 6.2.5 of test plan.

DATE: 20-Jun-02 All Functional Testing done per 6.1 except backlight and IR port.

Subject samples to

SERIAL#	Front	Back	Top	Bottom	Left side	Right side	Testing
NJD000109P							
NJD000110P							
NJD000111P							
NJD000113P							
NJD000114P							
NJD000116P							
NJD000119P							
NJD000120P							
NJD000121P							
NJD000122P							
NJD000123P							
NJD000124P							
NJD000126P							
NJD000127P							
NJD000128P							
NJD000129P							
NJD000130P							
NJD000131P							
NJD000133P							
NJD000134P							
NJD000136P							
NJD000137P							

NOTES: A=
B=

RESULTS:

EQUIPMENT:

Test Path #3 from DVT Plan 288117-70020 Section 7.0

DVT Pre-Test Performed to verify operational units.

Serial Number	Buttons operational	Audio	LCD	Battery contact	Battery Door	Real time clock	IR	Backlight	Communication	Results
NJD000081P	x	x	x	x	x	x	x	x	x	OK
NJD000082P	x	x	x	x	x	x	x	x	x	OK
NJD000083P	x	x	x	x	x	x	x	x	x	OK
NJD000084P	x	x	x	x	x	x	x	x	x	OK
NJD000086P	x	x	x	x	x	x	x	x	x	OK
NJD000087P	x	x	x	x	x	x	x	x	x	OK
NJD000089P	x	x	x	x	x	x	x	x	x	OK
NJD000092P	x	x	x	x	x	x	x	x	x	OK
NJD000093P	x	x	x	x	x	x	x	x	x	OK
NJD000094P	x	x	x	x	x	x	x	x	x	OK
NJD000096P	x	x	x	x	x	x	x	x	x	OK
NJD000097P	x	x	x	x	x	x	x	x	x	OK
NJD000098P	x	x	x	x	x	x	x	x	x	OK
NJD000099P	x	x	x	x	x	x	x	x	x	OK
NJD000100P	x	x	x	x	x	x	x	x	x	OK
NJD000101P	x	x	x	x	x	x	x	x	x	OK
NJD000102P	x	x	x	x	x	x	x	x	x	OK
NJD000103P	x	x	x	x	x	x	x	x	x	OK
NJD000104P	x	x	x	x	x	x	x	x	x	OK
NJD000106P	x	x	x	x	x	x	x	x	x	OK
NJD000107P	x	x	x	x	x	x	x	x	x	OK
NJD000108P	x	x	x	x	x	x	x	x	x	OK

Testing performed by Date: 23-May-02

EQUIPMENT: I

Exhibit D (cont.)

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices.

DATE: 29 MAY 02 INITIAL VISUAL & ELECTRICAL

		Requestor
SERIAL#	VISUAL	did functional
NJD000081P	O.K.	X
NJD000082P	O.K.	X
NJD000083P	O.K.	X
NJD000084P	O.K.	X
NJD000086P	O.K.	X
NJD000087P	O.K.	X
NJD000089P	O.K.	X
NJD000092P	O.K.	X
NJD000093P	O.K.	X
NJD000094P	O.K.	X
NJD000096P	O.K.	X
NJD000097P	O.K.	X
NJD000098P	O.K.	X
NJD000099P	O.K.	X
NJD000100P	O.K.	X
NJD000101P	O.K.	X
NJD000102P	O.K.	X
NJD000103P	O.K.	X
NJD000104P	O.K.	X
NJD000106P	O.K.	X
NJD000107P	O.K.	X
NJD000108P	O.K.	X
Date: Complete	29-May	

RESULTS: NO ANOMALIES NOTED

Exhibit D (cont.)

Exhibit D (cont.)

SUMMERY SHEET

PAR# 5365 **TEST PLAN: 288117-70020** **TECH:**

Patient Programmer for Neuro devices.

DATE: 29-May-02 All Functional Testing done per 6.1 except backlight and IR port.

Subject samples to degrees F and RH for days. Test samples per request days.

SERIAL#						
NJD000081P						
NJD000082P						
NJD000083P						
NJD000084P						
NJD000086P						
NJD000087P						
NJD000089P						
NJD000092P						
NJD000093P						
NJD000094P						
NJD000096P						
NJD000097P						
NJD000098P						
NJD000099P						
NJD000100P						
NJD000101P						
NJD000102P						
NJD000103P						
NJD000104P						
NJD000106P						
NJD000107P						
NJD000108P						
Date: Complete	3-Jun	3-Jun	4-Jun	4-Jun	19-Jun	19-Jun

NOTES: A=

B=

C=

D=

E=

F=

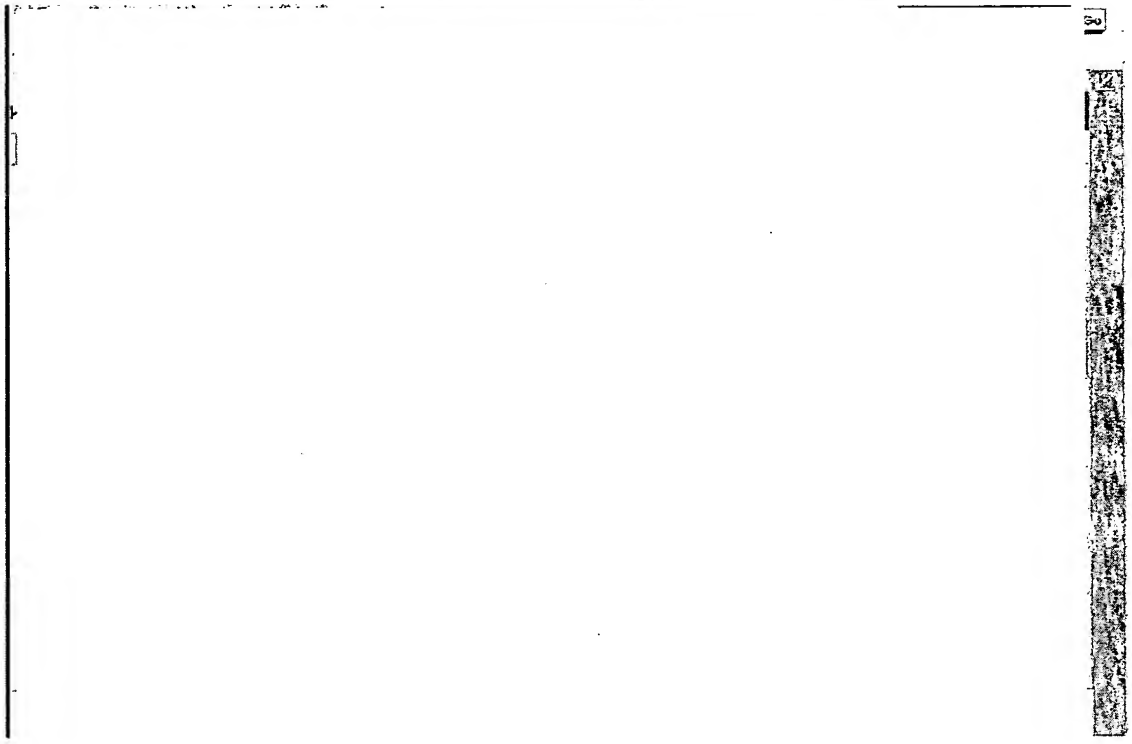
G=

RESULTS: H=

EQUIPMENT:

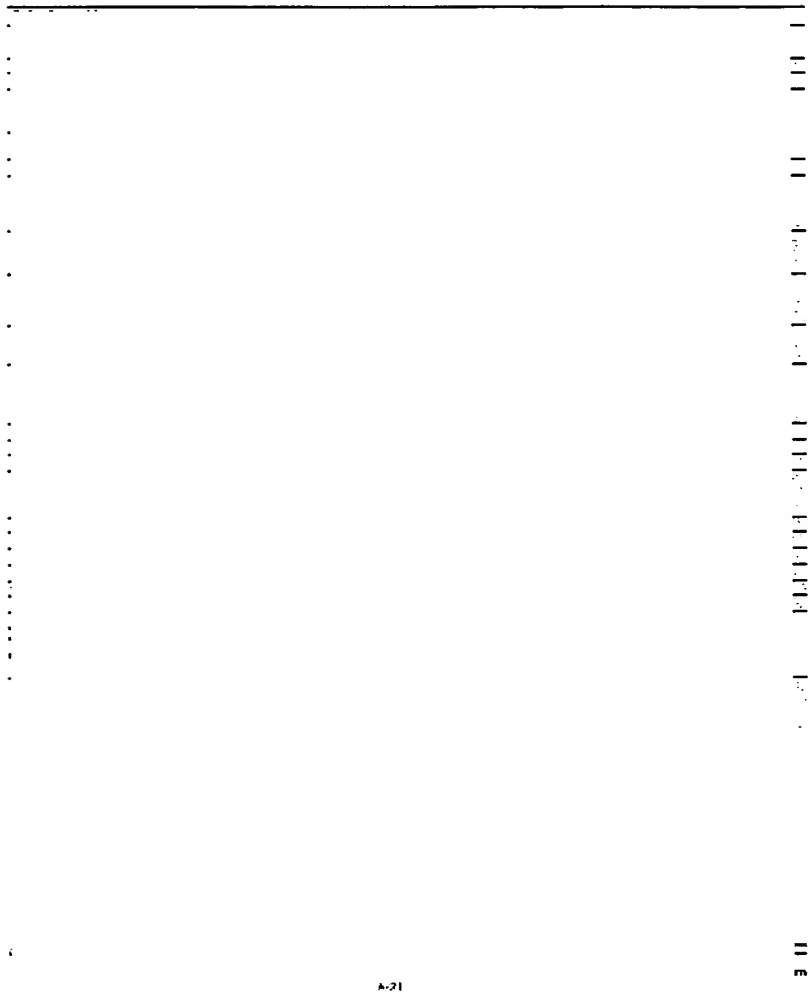
Exhibit D (cont.)

Section 6.3.6 Button Endurance - Specification for KSS321G, used for
. . . buttons (
Life Cycle data show life expectancy of

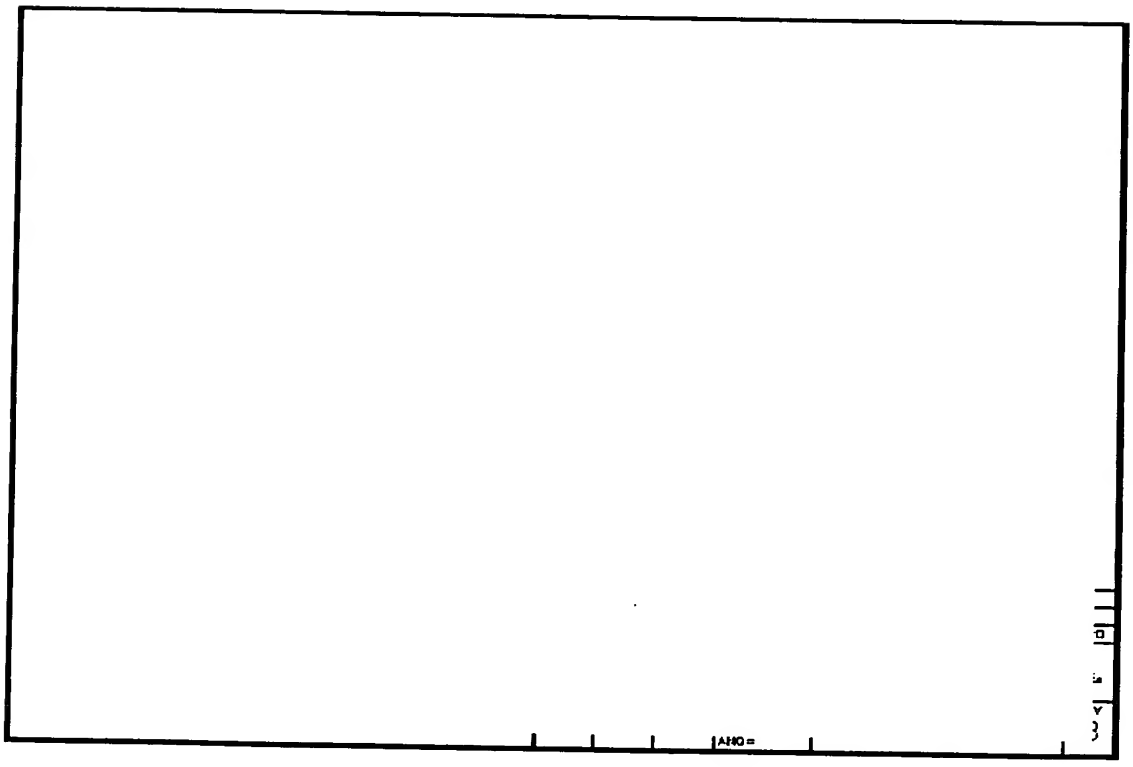


Section 6.3.8 Flamability - Both top and bottom housings are made from

Section 6.3.6 - Button Endurance - Specification for KSC621- Used for top buttons (
Life Cycle data show life expectancy



Section 6.3.6 - Button Endurance - Specification for F
Used for
. Life Cycle data show
life expectancy of



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Section 6.3.7 Scratch resistance -